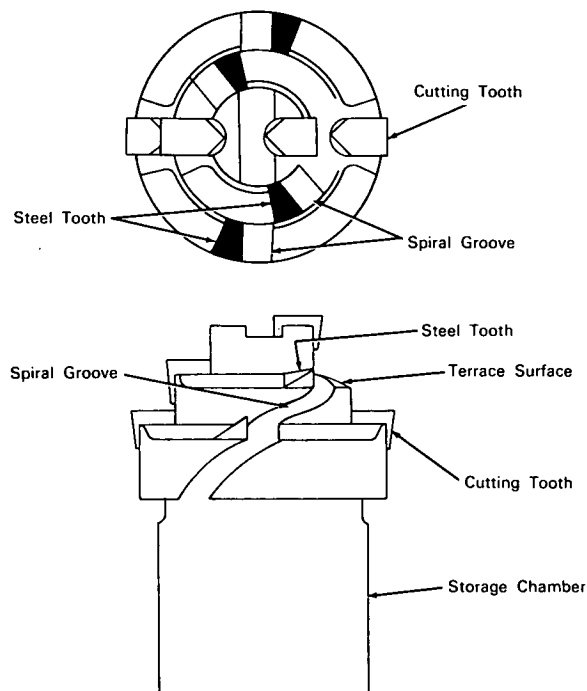


NASA TECH BRIEF



NASA Tech Briefs are issued by the Technology Utilization Division to summarize specific technical innovations derived from the space program. Copies are available to the public from the Clearinghouse for Federal Scientific and Technical Information, Springfield, Virginia, 22151.

Rock Bit Requires No Flushing Medium to Maintain Drilling Speed



The problem: Boring small holes through rock, concrete, or other hard materials with low power driving mechanisms and no flushing medium.

The solution: A specially designed drilling tool that picks up its own cuttings and stores them in a receptacle directly behind the cutting head.

How it's done: The steel bit has terraces machined into its face with a single tooth mounted on each terrace. The teeth are mounted so that their cutting edges are as high as possible above their respective terraces. The terraces are machined with surface elements angular to rather than perpendicular to the

drill axis, except in the immediate vicinity of a tooth. The terraces are intersected by spiral grooves with a steel tooth located on each trailing edge of such intersections. Each of these steel teeth is only slightly shorter than its adjacent cutting tooth and acts to sweep the cut particles directly into the spiral groove. A pair of spiral grooves leading from the bit face, with the aid of tapered cavities, channel rock particles into a storage chamber. These spiral grooves taper from their opening at the storage chamber to their most forward extremity at the bit face in such a way that the motion of the bit promotes flow of the cuttings to the storage chamber.

(continued overleaf)

Notes:

1. This drill bit could have value for geological investigation where pure, unadulterated samples are required.
2. While the present design is for low power, light-weight drills, it seems likely that it could be scaled up to do heavier work.
3. Inquiries concerning this invention may be directed to:

Technology Utilization Officer
Jet Propulsion Laboratory
4800 Oak Grove Drive
Pasadena, California, 91103
Reference: B65-10109

Patent status: NASA encourages the immediate commercial use of this invention. Inquiries about obtaining rights for its commercial use may be made to NASA, Code AGP, Washington, D.C., 20546.

Source: Hughes Aircraft Company
under contract to Jet Propulsion Laboratory
(JPL-WOO-031)